

CLAIMS

What is claimed is:

1 1. A method of interacting with a client process on a mobile device connected to a
2 network over a wireless link, the method comprising the steps of:
3 receiving at a mobile interactions server a first message from the client process
4 indicating a first action by a user of the mobile device, the first action related
5 to a first graphical element displayed on the device for requesting a service
6 from an application;
7 based on the first message, determining whether the action is associated with an event
8 type of a plurality of predetermined event types;
9 if it is determined the action is not associated with the event type, then, without
10 invoking any method of the application,
11 generating first data describing any change in the first graphical element; and
12 sending the first data to the client process for changing the display of the first
13 graphical element.

1 2. The method of Claim 1, further comprising, if it is determined the action is associated
2 with the event type, then performing the steps of:
3 generating second data describing a particular event of the event type;
4 invoking a particular event handling method of the application to provide the service,
5 the particular event handling method associated with the event type; and
6 passing the second data to the event handling method.

1 3. The method of Claim 1, further comprising, before said step of receiving the first
2 message, the steps of:
3 receiving second data from the application describing the first graphical element and
4 indicating one or more event handling methods associated with the first
5 graphical element; and
6 passing the second data to the client process for displaying the first graphical element.

1 4. The method of Claim 3, wherein each of the one or more event handling methods is
2 associated with one event type of the plurality of predetermined event types.

1 5. The method of Claim 2, wherein the particular event handling method is associated
2 with one event type of the plurality of predetermined event types.

1 6. The method of Claim 5, wherein a name of the particular event handling method
2 indicates the one event type with which it is associated.

1 7. The method of Claim 2, wherein the particular event handling method is associated
2 with the first graphical element.

1 8. The method of Claim 1, wherein the plurality of predetermined events types does not
2 include an event type associated with the user of the mobile device pressing a character key.

1 9. The method of Claim 1, wherein the plurality of predetermined event types includes
2 an exit-graphical-element event type and an enter-graphical-element event type.

1 10. The method of Claim 9, said step of determining whether the action is associated with
2 an event type further comprising:

3 determining whether the first message indicates the first action corresponds to one of
4 moving a cursor from the first graphical element and pressing an enter key;
5 and
6 if the first action does correspond to one of moving the cursor from the first graphical
7 element and pressing the enter key, then the first action is associated with the
8 exit-graphical-element event type.

1 11. The method of Claim 9, said step of determining whether the action is associated with
 2 an event type further comprising:
 3 determining whether the first message indicates the first action corresponds to moving
 4 a cursor onto the first graphical element; and
 5 if the first action does correspond to moving the cursor onto the first graphical
 6 element, then the first action is associated with the enter-graphical-element
 7 event type .

1 12. The method of Claim 1, wherein
 2 the first graphical element is included in a page of one or more graphical elements
 3 associated with requesting the service from the application; and
 4 the plurality of predetermined event types includes an exit-page event type and an
 5 enter-page event type.

1 13. The method of Claim 12, said step of determining whether the action is associated
 2 with an event type further comprising:
 3 determining whether the first message indicates the first action corresponds to
 4 pressing an enter key on a graphical element associated with a reference to a
 5 different page; and
 6 if the first action does correspond to pressing the enter key on the graphical element
 7 associated with the reference to the different page, then the first action is
 8 associated with the exit-page event type and the enter-page event type.

1 14. The method of Claim 12, said step of determining whether the action is associated
 2 with an event type further comprising:
 3 determining whether the first message indicates the first action corresponds to
 4 pressing an enter key on a last graphical element on the page; and
 5 if the first action does correspond to pressing the enter key on the last graphical
 6 element on the page, then the first action is associated with the exit-page event
 7 type.

1 15. The method of Claim 1, wherein
2 the first graphical element is included in a page of one or more graphical elements
3 associated with requesting the service from the application; and
4 the plurality of predetermined event types includes an special-key-pressed event type.

1 16. The method of Claim 15, said step of determining whether the action is associated
2 with an event type further comprising:
3 determining whether the first message indicates the first action corresponds to one of
4 pressing a page-back key, pressing a page-forward key and pressing a menu
5 key; and
6 if the first action does correspond to one of pressing a page-back key, pressing a page-
7 forward key and pressing a menu key, then the first action is associated with
8 the special-key-pressed event type.

1 17. The method of Claim 1, wherein the plurality of predetermined event types includes
2 an exit-application event type and an enter-application event type.

1 18. The method of Claim 17, said step of determining whether the action is associated
2 with an event type further comprising:
3 determining whether the first message indicates the first action corresponds to
4 pressing an enter key on a graphical element associated with a main menu
5 item; and
6 if the first action does correspond to pressing the enter key on the graphical element
7 associated with the main menu item, then the first action is associated with the
8 enter-application event type.

1 19. The method of Claim 17, wherein:
2 the first graphical element is included in a page of one or more graphical elements
3 associated with requesting the service from the application;
4 the application includes one or more pages; and

5 said step of determining whether the action is associated with an event type further
6 comprising
7 determining whether the first message indicates the first action corresponds to
8 pressing an enter key on a last graphical element on a page without a
9 reference to a different page; and
10 if the first action does correspond to pressing the enter key on the last
11 graphical element on the page without the reference to the different
12 page, then the first action is associated with the exit-application event
13 type.

1 20. The method of Claim 2, further comprising, if the particular event handling method
2 determines no more pages of one or more graphical elements are to be provided by the
3 application, then receiving third data indicating a particular exception in a particular event
4 exception handling method of the mobile interactions server for exiting the application.

1 21. The method of Claim 2, further comprising, if the particular event handling method
2 determines a request is to be made to a network resource having a particular URL address,
3 then receiving third data indicating a particular exception and the URL address in a particular
4 event exception handling method of the mobile interactions server for sending the request to
5 the network resource.

1 22. The method of Claim 2, further comprising, if the particular event handling method
2 determines not to complete processing of the particular event, then receiving third data
3 indicating a particular exception in a particular event exception handling method of the
4 mobile interactions server for skipping all remaining event handling methods for the
5 particular event.

1 23. The method of Claim 2, further comprising, if the particular event handling method
2 determines not to complete processing of the particular event, then receiving third data
3 indicating a particular exception in a particular event exception handling method of the
4 mobile interactions server for invoking all remaining event handling methods of the
5 application for the particular event.

1 24. The method of Claim 2, further comprising, if the particular event handling method
2 determines not to complete processing of the particular event, then receiving third data
3 indicating a particular exception in a particular event exception handling method of the
4 mobile interactions server for invoking only the event handling methods of the mobile
5 interactions server for the particular event.

1 25. The method of Claim 2, wherein the particular event handling method inherits from a
2 first event handling interface provided by the mobile interactions server, the first event
3 handling interface defining the plurality of event types.

1 26. The method of Claim 25, wherein the first event handling interface inherits from a
2 JAVA event handling interface.

1 27. A method of interacting with a client process on a mobile device connected to a
2 network over a wireless link, the method comprising the steps of:
3 sending from an application to a mobile interactions server first data describing a first
4 graphical element for display on the mobile device and one or more event
5 handling methods of the application associated with the first graphical
6 element;
7 receiving at a particular event handling method of the plurality of event handling
8 methods second data describing an event having a particular event type of a
9 plurality of predetermined event types in response to an action by a user of the
10 mobile device; and
11 providing a service for the client process in response to receiving the second data,
12 wherein
13 the particular event handling method is associated with the particular event
14 type, and
15 the action is determined by the mobile interactions server to be associated with
16 the particular event type.

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1 28. The method of Claim 27, the method further comprising the steps of:
2 determining whether to invoke an exception handling method of the mobile
3 interactions server; and
4 if it is determined to invoke the exception handling method, then sending third data
5 describing a particular exception to the exception handling method.

1 29. The method of Claim 28, wherein the particular exception is associated with no more
2 pages of one or more graphical elements for the client process.

1 30. The method of Claim 28, wherein the particular exception is associated with
2 redirecting the mobile interactions server to a network resource having a particular URL
3 address.

1 31. The method of Claim 28, wherein the particular exception is associated with aborting
2 all event handlers for the event.

1 32. The method of Claim 28, wherein the particular exception is associated with
2 interrupting the particular event handler for the event.

1 33. The method of Claim 28, wherein the particular exception is associated with invoking
2 only an event handler of the mobile interactions server for the event.

1 34. A computer-readable medium carrying instructions for interacting with a client
2 process on a mobile device connected to a network over a wireless link, the computer-
3 readable medium comprising instructions for causing one or more processors to perform the
4 steps of:
5 receiving over the network a first message from the client process indicating a first
6 action by a user of the mobile device, the first action related to a first graphical
7 element displayed on the device for requesting a service from an application;

8 based on the first message, determining whether the action is associated with an event
9 type of a plurality of predetermined event types;
10 if it is determined the action is not associated with the event type, then, without
11 invoking any method of the application,
12 generating first data describing any change in the first graphical element; and
13 passing the first data to the client process for changing the display of the first
14 graphical element.

1 35. The computer-readable medium of Claim 34, the instructions further causing the one
2 or more processors to perform the step of, if it is determined the action is associated with the
3 event type, then:

4 generating second data describing a particular event of the event type;
5 invoking a particular event handling method of the application to provide the service,
6 the particular event handling method defined for the event type; and
7 passing the second data to the event handling method.

1 36. The computer-readable medium of Claim 34, the instructions further causing the one
2 or more processors to perform the step of, before said step of receiving the first message,:
3 receiving second data from the application describing the first graphical element and
4 indicating one or more event handling methods associated with the first
5 graphical element; and
6 passing the second data to the client process for displaying the first graphical element.

1 37. The computer-readable medium of Claim 36, wherein each of the one or more event
2 handling methods is associated with one event type of the plurality of predetermined event
3 types.

1 38. The computer-readable medium of Claim 35, wherein the particular event handling
2 method is associated with one event type of the plurality of predetermined event types.

1 39. The computer-readable medium of Claim 38, wherein a name of the particular event
2 handling method indicates the one event type with which it is associated.

1 40. The computer-readable medium of Claim 35, wherein the particular event handling
2 method is associated with the *first* graphical element.

1 41. The computer-readable medium of Claim 34, wherein the plurality of predetermined
2 events types does not include an event type associated with the user of the mobile device
3 pressing a character key.

1 42. The computer-readable medium of Claim 34, wherein the plurality of predetermined
2 event types includes an exit-graphical-element event type and an enter-graphical-element
3 event type.

1 43. The computer-readable medium of Claim 42, said step of determining whether the
2 action is associated with an event type further comprising:
3 determining whether the first message indicates the first action corresponds to one of
4 moving a cursor from the first graphical element and pressing an enter key;
5 and
6 if the first action does correspond to one of moving the cursor from the first graphical
7 element and pressing the enter key, then the first action is associated with the
8 exit-graphical-element event type.

1 44. The computer-readable medium of Claim 42, said step of determining whether the
2 action is associated with an event type further comprising:
3 determining whether the first message indicates the first action corresponds to moving
4 a cursor onto the first graphical element; and
5 if the first action does correspond to moving the cursor onto the first graphical
6 element, then the first action is associated with the enter-graphical-element
7 event type .

1 45. The computer-readable medium of Claim 34, wherein
 2 the first graphical element is included in a page of one or more graphical elements
 3 associated with requesting the service from the application; and
 4 the plurality of predetermined event types includes an exit-page event type and an
 5 enter-page event type.

1 46. The computer-readable medium of Claim 45, said step of determining whether the
 2 action is associated with an event type further comprising:
 3 determining whether the first message indicates the first action corresponds to
 4 pressing an enter key on a graphical element associated with a reference to a
 5 different page; and
 6 if the first action does correspond to pressing the enter key on the graphical element
 7 associated with the reference to the different page, then the first action is
 8 associated with the exit-page event type and the enter-page event type.

1 47. The computer-readable medium of Claim 45, said step of determining whether the
 2 action is associated with an event type further comprising:
 3 determining whether the first message indicates the first action corresponds to
 4 pressing an enter key on a last graphical element on the page; and
 5 if the first action does correspond to pressing the enter key on the last graphical
 6 element on the page, then the first action is associated with the exit-page event
 7 type.

1 48. The computer-readable medium of Claim 34, wherein
 2 the first graphical element is included in a page of one or more graphical elements
 3 associated with requesting the service from the application; and
 4 the plurality of predetermined event types includes an special-key-pressed event type.

1 49. The computer-readable medium of Claim 48, said step of determining whether the
2 action is associated with an event type further comprising:
3 determining whether the first message indicates the first action corresponds to one of
4 pressing a page-back key, pressing a page-forward key and pressing a menu
5 key; and
6 if the first action does correspond to one of pressing a page-back key, pressing a page-
7 forward key and pressing a menu key, then the first action is associated with
8 the special-key-pressed event type.

1 50. The computer-readable medium of Claim 34, wherein the plurality of predetermined
2 event types includes an exit-application event type and an enter-application event type.

1 51. The computer-readable medium of Claim 50, said step of determining whether the
2 action is associated with an event type further comprising:
3 determining whether the first message indicates the first action corresponds to
4 pressing an enter key on a graphical element associated with a main menu
5 item; and
6 if the first action does correspond to pressing the enter key on the graphical element
7 associated with the main menu item, then the first action is associated with the
8 enter-application event type.

1 52. The computer-readable medium of Claim 50, wherein:
2 the first graphical element is included in a page of one or more graphical elements
3 associated with requesting the service from the application;
4 the application includes one or more pages; and
5 said step of determining whether the action is associated with an event type further
6 comprises
7 determining whether the first message indicates the first action corresponds to
8 pressing an enter key on a last graphical element on a page without a
9 reference to a different page; and

10 if the first action does correspond to pressing the enter key on the last
11 graphical element on the page without the reference to the different
12 page, then the first action is associated with the exit-application event
13 type.

1 53. The computer-readable medium of Claim 35, the instructions further causing the one
2 or more processors to perform the step of, if the particular event handling method determines
3 no more pages of one or more graphical elements are to be provided by the application, then
4 receiving third data indicating a particular exception in a particular event exception handling
5 method of the mobile interactions server for exiting the application.

1 54. The computer-readable medium of Claim 35, the instructions further causing the one
2 or more processors to perform the step of, if the particular event handling method determines
3 a request is to be made to a network resource having a particular URL address, then receiving
4 third data indicating a particular exception and the URL address in a particular event
5 exception handling method of the mobile interactions server for sending the request to the
6 network resource.

1 55. The computer-readable medium of Claim 35, the instructions further causing the one
2 or more processors to perform the step of, if the particular event handling method determines
3 not to complete processing of the particular event, then receiving third data indicating a
4 particular exception in a particular event exception handling method of the mobile
5 interactions server for skipping all remaining event handling methods for the particular event.

1 56. The computer-readable medium of Claim 35, the instructions further causing the one
2 or more processors to perform the step of, if the particular event handling method determines
3 not to complete processing of the particular event, then receiving third data indicating a
4 particular exception in a particular event exception handling method of the mobile
5 interactions server for invoking all remaining event handling methods of the application for
6 the particular event.

1 57. The computer-readable medium of Claim 35, the instructions further causing the one
2 or more processors to perform the step of, if the particular event handling method determines
3 not to complete processing of the particular event, then receiving third data indicating a
4 particular exception in a particular event exception handling method of the mobile
5 interactions server for invoking only the event handling methods of the mobile interactions
6 server for the particular event.

1 58. The computer-readable medium of Claim 35, wherein the particular event handling
2 method inherits from a first event handling interface provided by the mobile interactions
3 server, the first event handling interface defining the plurality of event types.

1 59. The computer-readable medium of Claim 58, wherein the first event handling
2 interface inherits from a JAVA event handling interface.

1 60. A computer-readable medium carrying instructions for interacting with a client
2 process on a mobile device connected to a network over a wireless link, the computer-
3 readable medium comprising instructions for causing one or more processors to perform the
4 steps of:
5 sending to a mobile interactions server first data describing a first graphical element
6 for display on the mobile device and one or more event handling methods of
7 the application associated with the first graphical element;
8 receiving at a particular event handling method of the plurality of event handling
9 methods second data describing an event having a particular event type of a
10 plurality of predetermined event types in response to an action by a user of the
11 mobile device; and
12 providing a service for the client process in response to receiving the second data,
13 wherein
14 the particular event handling method is associated with the particular event
15 type, and
16 the action is determined by the mobile interactions server to be associated with
17 the particular event type.

1 61. The computer-readable medium of Claim 60, the instructions further causing the one
2 or more processors to perform the steps of:
3 determining whether to invoke an exception handling method of the mobile
4 interactions server; and
5 if it is determined to invoke the exception handling method, then sending third data
6 describing a particular exception to the exception handling method.

1 62. The computer-readable medium of Claim 61, wherein the particular exception is
2 associated with no more pages of one or more graphical elements for the client process.

1 63. The computer-readable medium of Claim 61, wherein the particular exception is
2 associated with redirecting the mobile interactions server to a network resource having a
3 particular URL address.

1 64. The computer-readable medium of Claim 61, wherein the particular exception is
2 associated with aborting all event handlers for the event.

1 65. The computer-readable medium of Claim 61, wherein the particular exception is
2 associated with interrupting the particular event handler for the event.

1 66. The computer-readable medium of Claim 61, wherein the particular exception is
2 associated with invoking only an event handler of the mobile interactions server for the event.